1:Beals E-5 (1940-1941)1946 NU34 Tarasco NU34
Sierra Tarascans
[p.4b]

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THE SETTING AND
THE PEOPLE

133 have large level tracts, for most of the elevated part of the State is in the so-called "volcanic axis" of Mexico. In many regions, and this is particularly true of the area occupied by the Tarascans, the characteristic sky line is a series of old volcanic cones, often surrounding basins or long depressions, in which more recent low cinder cones frequently occur (pl. 1, upper and lower left). Dozens of peaks have elevations of over 10,000 feet, but only one may exceed 11,000 feet.

To the south and southwest the terrain drops sharply toward a great basin formed by tributaries of the Balsas River. The slope is steep and so thoroughly dissected by streams that, despite the opening of many roads and truck trails in recent years, it still is not possible to reach the Balsas River by road from highland Michoacán. This great basin forms an important portion of Michoacán and is much visited by the Tarascans. Tropical vegetation and climate characterize the basin except for a semiarid section in the west.

The Pacific coast of the State is paralleled by a large range of mountains, the Sierra de

133 Coalcomán, which again reaches elevations of over 10,000 feet. The rain shadow of this
[132] range accounts for the subarid conditions of part of the basin area. Although these mountains are little known, apparently they rise fairly steeply on both faces and the coastal area beyond is narrow and of little use.

The drainage of Michoacán presents some peculiarities. In the north and west central region are lakes of various size, of which perhaps the best known is Lake Pátzcuaro. In common with some other lakes in the area, Lake Pátzucuaro has no outlet, but its waters are nevertheless not brackish. The high porosity of the volcanic soil may account for this phenomenon, for the lake has evidently been isolated from other drainages for a long period of time. This isolation is attested by the fact
[136] that the native fish are all very primitive viviparous species.

Moreover, despite heavy rainfall in some
[132] areas (at Lake Pátzcuaro the average annual rainfall is around 60 inches), there are virtually no permanent streams and even springs are rare. Most Tarascan towns suffer from
[312] almost constant water shortage despite the heavy precipitation. In contrast, some of the lower lands have abundant large running streams. In places, underground springs of great size emerge at elevations of about 5,500 feet. Near Uruapan, for example, a large stream is formed by a group of such springs.

131 The present-day range of the Tarascans cannot be defined with great accuracy, partly be-
101 cause of the lack of detailed studies and partly because of the degree of acculturation undergone by many settlements. Villages which outwardly differ in no visible respect from well-known Tarascan settlements often contain no persons speaking Tarascan. All around the edges of Tarascan territory occur villages in various degrees of assimilation to Mexican culture and with various degrees of physical mixture with the Mestizo population. As a result, the present-day distribution of the Tarascans can only be approximated (map 1).

On the east, the basin of Lake Pátzcuaro is definitely Tarascan, although some towns, such as Tzintzuntzan, the traditional capital of the Tarascan "Empire," are no longer Tarascan-speaking. The western edge of Tarascan ter-

243 While crops are small, posts are placed in the fields to provide perching places for hawks.

Worms may damage small plants to the point that reseeding is necessary, especially if there are long periods of cloudy weather without rain. Worms also damage about 35 percent of the ears. Deer damage crops badly only in isolated mountain fields. Badgers in some places are serious pests. The only remedy is to attempt to shoot the animals. Birds do little damage. Some maize is attacked by a fungus. [262] The fungus is eaten, but it is not sold or prized as a delicacy as is the case in some parts of Mexico.

243 672 685 Trespass by domestic animals and theft must be guarded against. Sometimes isolated fields are completely stripped if not watched. Stray animals caught damaging corn are taken to the *municipio* and held in jail until the owner pays for the damage.

243 [132] Unseasonal frost often damages corn, particularly late plantings and in fields at high altitudes. In 1940, frost, heavy enough to damage some fields, occurred on September 29.

When maize is about 1 foot high it is cultivated ("*escarda*" also "*trozando*") by running the plow between the rows, throwing dirt toward the plants. This is done a second time when the plants are about 18 inches tall. If it is delayed too long, the roots may be cut, the maize leaves will yellow at the tip, and no ears will form.

When the maize is in tassel, after the rainy season is well underway, the fields are weeded "*chaponeado.*" [412] This is done by hand with a short machete, called "*os,*" with a sharp curve at the point. Also, earth is piled around such plants as were not sufficiently covered by the cultivation. If the weeds are bad, a second weeding is sometimes done, but not often. If weeding is omitted, weeds climb high up the stalks and the crop suffers considerably. The weeds removed are piled up beside the fields and are not used for feed or fertilizer.

243 221 674 As soon as grain is well formed on the ears, some maize is used for food, usually roasted. At this time, also, guards must be set in the fields, not only to keep animals out, but to prevent theft. Whole families may move to temporary field shelters at this time and remain until the harvest. In the "plains," usually

593 sleeps on mats in the kitchen, husband and wife
512 on one mat with a single blanket. Small children under 9 or 10 years old sleep with the parents; above that age they sleep on separate mats and have a separate blanket.

512 The general weekly routine of the family of
517 a farmer or of a forest worker, who represent the typical Cherán families, is about as follows. On Sunday most of the women go to Mass at 6:30 or 7. The men may go at this time or wait until the 8 o'clock Mass, or may stay home and sweep the courtyard and street in front of the house. Children usually go to the 8 o'clock Mass. Most people do not eat until after Mass.

After Mass, men stand around the church and plaza or on the streets talking to their friends before going home for breakfast. After breakfasting, the young men get towels
[515] and go to the bathing place in one of the *barrancas* (about a mile from town) and bathe. The older men go out and loaf about the streets all morning, talking to friends and acquaintances. Older men bathe less often, but also usually bathe on Sunday. Between 11 and 12 the younger men return home, eat again, pick up their blankets (it is more apt to be windy or
[132] rainy in the afternoons) and go out on the streets to meet their friends again. Women may go out after dinner and visit neighbors. Small children, it might be noted, do not go to Mass but play around the house and nearby streets all day. A young unmarried man may hang around the corner near the house of some girl in whom he is interested. If the girl is also interested, she will go out after water several times during the day and the two will talk on the streets. If they are clever and the girl's family is either not very strict or not very suspicious, they may manage to talk together several hours.

At 5 p. m. is the *Rosario*, attended by many women, some men, and many of the young people. After the *Rosario* is the favorite time for steal-
[584] ing a girl for a wedding and, especially in the fall, the young man may be involved in helping his friends. Or he may simply walk along in the direction his girl is going in the hope of having a chance to talk to her. Alternatively, he may talk on the streets with friends or go to one of the billiard parlors. Although people eat later than usual on Sundays, the young

175 for thirty or fifty years at very low rents,
423 so the Indians were actually left without
[648] land. This is reported to have happened in
[656] about fifty towns.[27]

The above information does not specify which towns lost their lands. The only concrete case cited is that involving the *jefe político* of Uruapan, a district which included several Indian villages. Unfortunately, no more information is available.

At the beginning of the Revolution, then, haciendas were found in the more level and warm areas north of the Sierra and Lake Pátzcuaro, on the southern shore of Lake Pátzcuaro, and also south of the present Tarascan region on the slopes toward the hot country. No hacienda has been studied nor is this the environment wherein the changes discussed in this paper take place. The present Tarascan-speaking area has not been dominated by haciendas, but is one of those where the towns of Indian peasants and artisans have survived longer, no matter what changes in land tenure occurred within the village.

[178] The main reason for the preservation of
Indian communities seems to be that this
[133] area was less desirable for the hacienda
[132] type of exploitation. The mountainous
character, forests, and cold climate did
not make it suitable for the introduction
of cattle or cash crops in large estates.[28]

The necessary background for our problem refers to the developments within the Indian villages in relation to the haciendas and to the individualization of land tenure as it took place from the late nineteenth century to the present time.

[621] The changes within the surviving Indian
towns can be described from two points
[578] of view: (a) disrupting factors making for
conflict within the village and breaking the
solidarity of the villagers against outsiders;
(b) the basic conservatism of the villages,
i. e., the survival of fundamental economic
conditions which tend to preserve the existence and internal solidarity of the villages.

The main disrupting factor is that of property differences within the village. As pointed out by Tannenbaum[29] for Mexico at large, the villages do not have sufficient land for the needs of all their inhabitants, and considerable differences as to property in land exist within the community, some people owning an adequate amount (according to local standards of living), some

27. Castillo, 1915, 144-5; also cited in Phipps, 1925, 118-120.
28. West, 1948, 17.
29. Tannenbaum, 1929, 58-60.

4: West K-5 (1946) 1948 NU34 Tarasco NU34
[P. 36]

133 stream.[5] Both lakes present similar shore features—moderately steep banks alternating with wide, flattish delta fans.

In other respects the two lakes are distinct. Pátzcuaro is shallow (deepest point in the southern arm, 20 feet; in the northern part, 50 feet, in 1941); Zirahuén is relatively deep (148 feet, maximum sounding). Moreover, while the level of Zirahuén (6,953 feet in 1942) is relatively stable, that of Pátzcuaro (6,671 feet in 1942) has fluctuated frequently in historical times. Since 1939 the lake level has descended nearly 4 feet, exposing large areas of mud flats along the shore and revealing one new island (Pastora) near the southwest corner of the lake (pl. 1). In some places the descending waters have uncovered old tree stumps, indicating that formerly the lake level was even lower than at present. On the other hand, the western portion of the large lacustrine plain of Chapultepec in historical times formed an eastward extension of the lake's southeast arm, denoting a former level higher than the present one.[6] The cause of fluctuation in level is not clear.

[132] De Buen (1944), judging from meteorological data (1939–43), has suggested a correlation between rainfall and evaporation variation on the one hand and lake surface fluctuation on the other. The excessive evaporation and low rainfall during those years likely affected lake volume, but normal precipitation and evaporation in following years have not halted the gradual decrease in lake level. Moreover, if fluctuation is caused by meteorological elements, one would expect neighboring lakes to be similarly affected. Periodic clearing and clogging of sublacustrine crevices, often associated with lakes of volcanic origin, is another popular hypothesis applied to Lake Pátzcuaro.

133 The lake contains 10 islets on which live some
361 of the most conservative of the Tarascan people—the fishermen. The four islands off the Tarfu-k'éri Peninsula (Pacanda, Yunuén, Tecuena, and Janitzio) are old volcanic hilltops with steep banks and, with the exception of flat-topped Pacanda, with little land suitable for cultivation. In the

[5] De Buen (1944) assigns the origin of all present and former lakes in the western portion of the Mesa Central to disruption of normal drainage by vulcanism. He also suggests that Lakes Patzcuaro, Zirahuén, Cuitzeo, and Yuriria were formed from portions of Río Lerma drainage, since the fish *Chirostoma*, abundant in Lake Chapala and the Lerma, is found also in these lakes, the number of species decreasing from Chapala (10) to Zirahuén (2).

[6] The 16th-century map of Lake Pátzcuaro which accompanies the Relación de Michoacán (1903) clearly shows the former extent of the southeastern arm. At the time of the Conquest this section included the island of Aputzio, now a hill some 300 FT. from the water's edge.

4: West K-5 (1946) 1948 NU34 Tarasco NU34

133 [312] [361] have attracted human settlement to the valley since prehistoric times. Sierra Tarascans, who call La Cañada "Erášemen" (view from above), [102] probably visited the valley for chile and early maize before the Spanish Conquest. Spaniards immediately seized the well-watered plains near Chilchota for wheat fields. Today La Cañada is a garden spot of orchards and wheat fields amid rocky volcanic hills.

CLIMATE AND VEGETATION

132 **Meteorological data.**—In dealing with meteorology, northwestern Michoacán will be treated as a whole; attempts will be made to point out regional differences in temperature and rainfall. Meteorological stations in the area are few; data are entirely lacking for the Sierra. Consequently, only general statements can be made concerning the weather and climate of modern Tarasca.

●132 Annual temperature ranges throughout the area are small.[8] Lowest winter temperatures occur in the Sierra, the Tarascan *tierra fría*, where nocturnal freezing and frosts are common from November to March [9] (map 3). Winter temperatures in the northern plateau and Lake Pátzcuaro areas are somewhat milder than those of the Sierra (January averages: Zamora, 16.2° C.; Zinapecuaro, 15.9°; Pátzcuaro, 13.9°), and the number of days with frost is smaller. The winters of the upper escarpment (*tierra templada*) are frost-free (January average for Uruapan, 16.0° C.). Summer

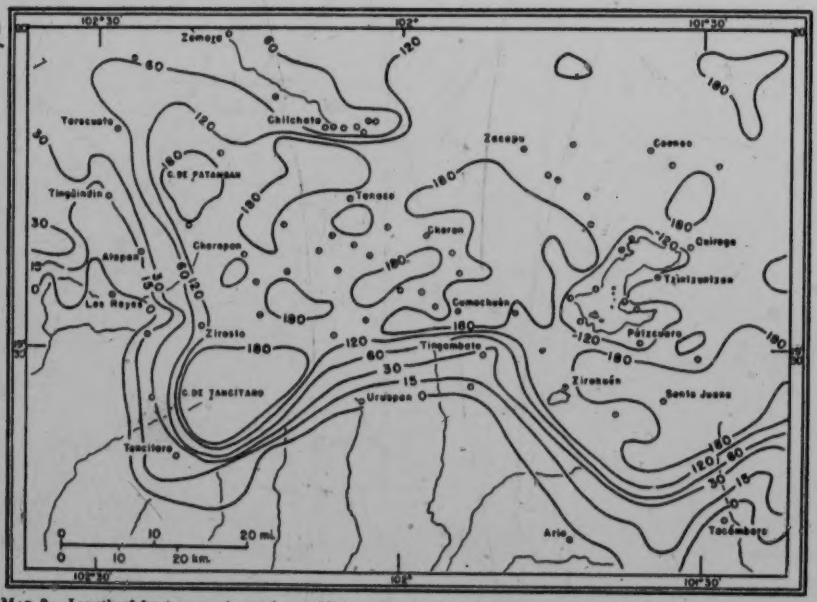
[Text continues top of p. 6-a---Analy9]

[8] Data from seven stations in the area give annual temperature ranges from 3.9° C. (Hacienda Tequecaran, 10 km. south of Uruapan) to 7.7° C. (Zacapu). The meteorological data given in text are taken from Atlas climatológico de México (Mexico. Servicio meteorlogico mexicano, 1930).

[9] The mining town of Tlalpujahua (elev. 8,300 feet), on the eastern border of Michoacán, 140 km. east of Pátzcuaro, may afford temperature data similar to that of the Sierra. December and January are the coldest months, with average monthly temperatures of 11.8° and 11.5°, respectively. Maximum temperatures occur in April and May (15.6° and 15.9° C.), which are probably somewhat lower than those occurring in the Sierra.

[P. 5c]

132



MAP 3.—Length of frost season in northwest Michoacán. Isopleths indicate the average length of annual period in days, in which frosts occur. Data are mainly from reckonings by local inhabitants.

132 temperatures are high over the entire Tarascan area, but less so in the higher Sierra. The warmest months are April and May, the period immediately before the rainy summer (May average temperatures: Zacapu, 19.1° C.; Uruapan, 22.4°; Zamora, 23.2°; Cuitzeo, 23.2°; Pátzcuaro, 19.9°).

Precipitation in the area, as in most parts of Mexico, is seasonal, 80 percent of the annual total falling mainly as convectional thundershowers in June, July, August, and September. In the Sierra the summer rains often continue as drizzles for a period of 3 to 4 days, suggesting local cyclonic origin.[9] Occasionally during the months of December and January light winter rains, called *cabañuelas*, or janínperkua, occur. These rains prevail over most of western Mexico when cyclonic disturbances over the Pacific reach inland, a condition which occurs every 3 or 4 years.[10] Such precipitation often falls as snow on the higher volcanoes in the Sierra, such as Tancítaro, Patamban, and Quinseo. Freak snow storms have been recorded in historical times; in September 1887 several inches of snow fell in the vicinity of Charapan and San Felipe, caving roofs and destroying the maize crop.[11] Another curious meteorological phenomenon of the Sierra is the prevalence of radiation fog in the low basins from late summer to early winter. Forming in the early morning hours (after 1 a. m.), the fog evaporates by noon. Its presence lowers average daily temperatures and prevents rapid evaporation of surface moisture.[12]

Annual precipitation in the area north and east of the Sierra averages from 750 to 850 mm. A greater amount is recorded around Lake Pátzcuaro (town of Pátzcuaro, 1,109 mm.), and even more probably falls in the Sierra, where no records exist. The greatest precipitation in Tarasca is recorded along the southern (windward) side of the Sierra in the upper escarpment zone. (Average annual totals for Uruapan, 1,683 mm.; Ario de Rosales, 1,225 mm.; Tacámbaro, 1,240 mm.)

[9] In northwestern Mexico, particularly in Sonora and the Sierra Madre Occidental, the winter cyclonic storms are called *equipatas*. Although they are part of the same frontal system, the *equipatas* occur more frequently than the *cabañuelas* since northwestern Mexico is nearer the North Pacific center of frontogenesis.

[10] Lumholtz (1902, vol. 2, p. 385) states that water has been known to freeze in Charán and Zacapu on June 10.

[11] The Sierra fogs are often mentioned by colonial chroniclers. One, describing the Charapan area in 1780: " . . . *continuamente se ve el terreno cubierto de nubes, que empapan y crean la humedad de la tierra*" (AGN Historia, vol. 73, f. 219).

132 137 **Climatic areas and associated vegetation.**—Sufficient statistical data are not available to construct accurately a map showing climatic types in the Tarascan area. Using (1) the available statistics from the few existing stations, (2) vegetation boundaries taken from field observations and aerial photographs, and (3) elevations from topographic maps compiled from aerial photography, an attempt has been made to locate climatic areas based on the Köppen system (map 4).

The Sierra.—The Cwb and Cwc climatic types of Köppen[13] correspond to the *tierra fría* of the Tarascans—the Sierra, its eastern extension (including the Sierra de Ozumatlán), and the southeastern part of the northern plateau area. A mixed oak-pine forest forms the dominant vegetation of the Sierra and its eastern extension, and corresponds to the higher and colder phase of the Cwb climatic zone. (Cf. maps 4 and 5.) *Pinus* 137 *leiophylla* (pino chino) and *P. michoacana* var. *cornuta* (pino lacio) are the principal pines (p'ukúri) of the Sierra (Martínez, 1945). (Pl. 1.) The former species is the main turpentine producer, while the latter, a straight, tall tree, affords the best lumber. Minor species of pines found in the Sierra include *P. teocote*, *P. pseudostrobus*, and in the upper escarpment zone, the subtropical pine *P. oocarpa*. Even at high altitudes the pines rarely form solid stands, but are mixed with numerous species of oak, the latter dominent at lower altitudes, the former at higher elevations. Some 30 species of oak (urĺkua, tukús, šarári), both deciduous and persistent, occur in the Sierra and adjacent areas. Among the more common are *Quercus fulva*, *Q. acuminata*, *Q. circinata*, *Q. laxa*, *Q. crassipes*, and *Q. pandurata* (Trelease, 1924). Often mixed with pine and oak are madroño (panáɲksa; *Arbutus* sp.); various laurels (Lauraceae); many hydrophytes in barranca bottoms, such as jaboncillo (sápu), palo blanco (uárpit-uku; *Alnus* sp.), palo colorado (čarápit-uku).

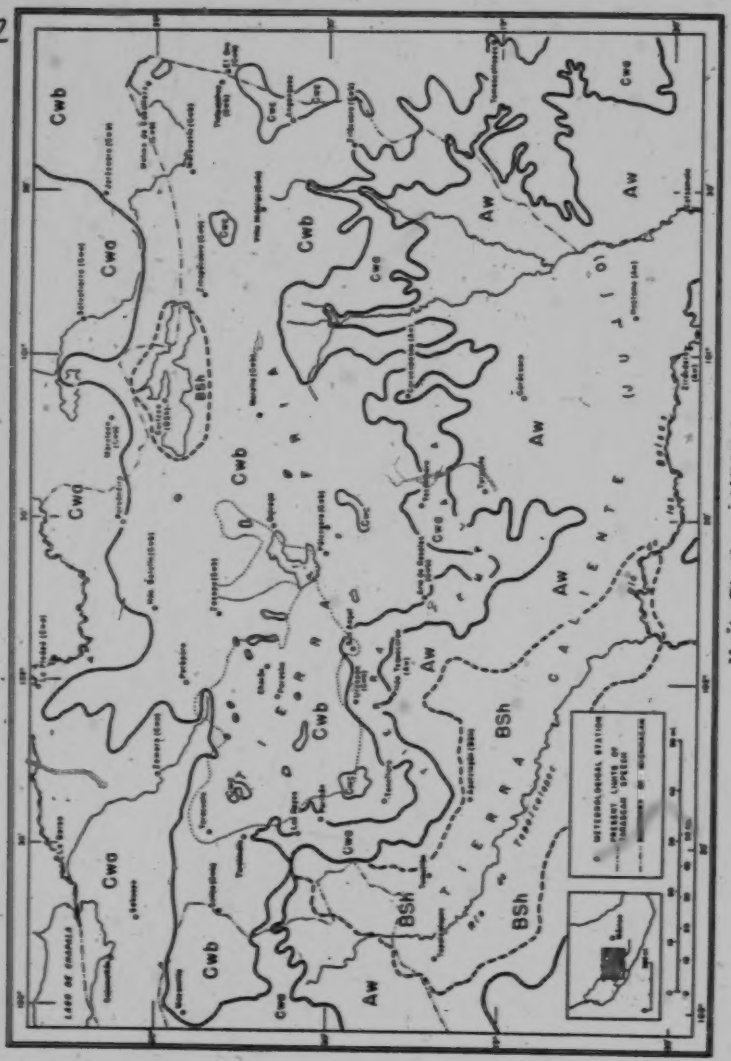
On lower slopes one often sees the Mexican "crab apple" (actually a hawthorne) or tejocote (kaiás; *Crataegus mexicana*) and the "cherry" or capulín (šéngua; *Prunus capuli*), both of which

[TEXT CONTINUES TOP of P. 8d --- ANALYSIS]

[13] Mathematical values of Köppen symbols: *C*, temperature of coldest month between −3° and 18° C.; *w*, dry winter, rainy summer; *b*, temperature of warmest month less than 22° C.; *c*, temperature of coldest month above −38° C., and mean temperature of less than 4 months out of the year is more than 10° C.

[P. 7]

132



Map 4.—Climatic map of Michoacán.

[137] are frequently semicultivated in hedgerows and in house lots. Agave (akámba; *A. latissima, A. americana*) is also a frequent hedge plant found particularly on the outskirts of settlements, and the tree yucca or izote (ɬámbaʂa; *Yucca australis*), although more common at lower altitudes, is often seen in Sierra villages. Understory vegetation in the oak-pine zone is sparse, possibly owing to the annual burning of herbaceous plants in the forest to improve summer forage. Some of the more prominent understory plants are *zarzamora* (ʂ'tún; *Rubus* sp.), a wild blackberry especially abundant along hedgerows, and wild grape vines (*Vitis* sp.). Various epiphytes, such as orchids of many species, are found on the trunks and branches of pine and oak throughout the Sierra.

[132] Although meteorological data are lacking, the climate of elevations above 10,000 feet is possibly Cwc, i. e., cold winters and cool summers (map 4). Such elevations occur on the upper slopes of the higher volcanoes, where snow occasionally falls and where fir (*Abies religiosa*) forms the dominant vegetation. On slopes above 8,700 feet this tree (*pinabete*, t'kúmbu) starts to appear among pine and oak. At 10,000 feet solid stands of fir begin and continue to the mountain peaks, where high altitude pine (*P. hartwegii*) has gained a foothold in cracks and crevices in rocky cliffs. Understory vegetation in the fir forest consists of various herbaceous plants, including a bunchgrass called *zacate* or jóčin (*Muhlenbergia macroura*). The green shoots of jóčin afford the principal forage for sheep and goat herds which are grazed on the high slopes of Cerro de Patamban and (before the eruption of Paricutin) on Cerro de Tancítaro.

The type of original vegetation in the basin plains within the Sierra is problematical. Probably cleared and cultivated for more than 300 years, these plains now show little evidence of the original vegetation cover. The dark-colored soil of the plains suggests the former presence of a grass cover, possibly with scattered oaks and pines.

[132] **The Lake district.**—According to temperature figures, the shores of Lake Pátzcuaro fall within the *tierra fría* climate (Cwb). Owing to higher winter temperatures than those experienced in the Sierra, and to absence of fog, the Lake district enjoys a warm phase of Cwb (possibly transitional between Cwb and Cwa). Oak and associated broadleaf trees, such as madroño, jaboncillo, etc.,

[137] form the dominant plant complex of a belt 3 km. wide around the lake. Moreover, colorín (p'oiénɨa; *Erythrina americana*), casahuate (*Ipomoea murucoides*), and zapote blanco (urĭata; *Casimiroa edulis*), all characteristic of the warmer sections of the northern plateau, are common hedge plants in the Lake area. Along the lake shore, water-loving plants, including a willow (tarímu; *Salix bonplandiana*), shrubs of "tepozán" (*Buddleia* sp.), and clumps of bamboolike carrizo (p'atámu; *Arundo donax*) are not uncommon; while in marshy sections canebrakes (*tule* or p'aĭímu; *Cyperus thrysiflorus*) abound. Other aquatic plants include various waterlilies and hyacinths (*Nymphaea* sp.; *Eichhornia speciosa*). Possibly a mixed pine-oak forest once covered the lower slopes bordering the lake, but, if so, the pines have long since been destroyed for firewood and lumber. Occasionally lone specimens of *Pinus leiophylla* are found on the outskirts of lake villages.

[132] **The northern plateau.**—The Cwb climate extends northward from the Sierra into the southeastern part of the northern plateau area. In the middle and lower Río Lerma Basin (Bajío) and in La Cañada, however, the Cwa climate of the *tierra templada* occurs. In both Cwa and Cwb areas of the northern plateau, oak and pine forests occupy only the summits of the higher hills, below which exist stands of oak and madroño. The lower slopes and plains carry an association of grass and shrub, the latter consisting of casahuate, zapote blanco, tejocote, palo blanco (*Lysiloma candida*), granjeno (*Celtis pallida*), jara amarillo (tóksten; *Senecio salignus*), all typical of the more humid portions of the central plateau. Xerophytes, such as huisache (*Acacia* sp.), mesquite (*Prosopis juliflora*), and various cacti (mainly *Opuntieae*), are common. In the plains, fresnos (padámu; *Fraxinus* sp.) form gallery forests along streams, and in draws within the hills hydrophytes, such as wild ahuacate and other laurels, predominate. Formerly extensive meadows existed at the edge of swamps and lakes, particularly in the lowlands east of Lake Chapala and the well-watered plains near the northern edge of the Sierra. In the northern plateau pine and oak forests were formerly more extensive than at present. Many of the hilltops north of the present México-Guadalajara highway, which are now barren of arboreal vegetation, were once

[TEXT CONTINUES TOP OF P. 9a---Analyst]

137 covered with pine and oak within the memory of living inhabitants. Increased cultivation of slopes and constant cutting for firewood and charcoal will soon destroy the greater part of the pine-oak remnants in the northern plateau.

132 **The escarpment zone.**—South of the Sierra lies a series of climatic types arranged in altitudinal sequence. The upper part of the escarpment (5,600 to 3,600 ft.) is characterized by a narrow belt of Cwa (*tierra templada*) climate, which is followed abruptly by the subhumid *tierra caliente* (below 3,600 feet), or Aw. Below 2,000 feet within the Tepalcatepec and Balsas Basins, a semiarid tropical climate (BSh) prevails.

137 The pine-oak association of the Sierra spills over onto the upper escarpment, but the subtropical *Pinus oocarpus* becomes the dominant pine. Between 4,600 and 3,600 feet, pines disappear, leaving an open oak forest mixed with subtropical and tropical plants of southern Mexico. At lower elevations the latter plants become dominant.[16]

SOILS

134 Three soil types, which tend to coincide with
132 climate and vegetation, predominate in the Tara-
137 scan area: (1) a yellowish-brown leached soil of the upper mountain slopes (Cwb to Cwc, pine-fir cover); (2) a dark, fine sandy loam (t'upúri) of the lower slopes and basins in the Sierra (Cwb, oak-pine, probably grass vegetation); and (3) the reddish-brown clay soil (čaránda) of the lower altitudes (warm phase of Cwb, Cwa, broadleaf vegetation) around Lake Pátzcuaro, in the lower elevations of the northern plateau, and in the escarpment zone (map 6). Transitional and special soil types also occur; for instance, many of the Sierra soils are termed "charandosas," having a higher clay content than the t'upúri loams.

134 **Yellowish-brown soil.**—This soil develops in high altitudes under seasonally humid conditions

[16] The tropical vegetation of the escarpment is characterized by a great variety of genera and species. The most common plants include the milky-sapped trees and shrubs of the family Moraceae—comuchín (*Ficus padifolia*), siranda (*F. paticlaris*), saruma (*Cecropia mexicana*); the pod-bearing Mimosaceae—timbin (*Mimosa stipulata*), guaje (*Leucaena* sp.), huisache (*Acacia* sp.), tepehuaje (*Lysiloma* sp.), parota (*Enterolobium cyclocarpum*), timuche (*Pithecellobium lanceolatum*), gujamuchil (*Pithecellobium dulce*), *Calliandra* sp.; the pod-bearing Caesalpiniaceae—habilla (*Cassia occidentalis*), cascalote (*Caesalpinia coriaria*), etc.; the edible fruit-bearing plants of the Annonaceae—chirimoya (*Annona cherimolia*); of the Lauraceae—ahuacate (*Persea americana*); of the Sapotaceae—chicozapote (*Achras sapota*), mamey (*Calocarpum mammosum*); of the Anacardiaceae—circuela, cupu (*Spondias mombin*); of the Mirtaceae—guayaba (*Psidium guayaba*); and the copal-bearing Burseraceae—copal (*Elaphrium jorullense*).

243 tion.[87] Owing to dry conditions and usually poor
[132] soils, yields are low. The infrequent light winter rains (*cabañuelas*) often determine the success or failure of the temporal crop. Another wheat type, a white soft variety, is called *"trigo de aguas"*; sown in June or July and reaped in November or December, it is seen in all parts
[312] of Tarasca. Most of the wheat crop of La Cañada is irrigated, being sown on the valley flats in December and harvested in May.[88] In the Sierra wheat is relegated to the less fertile slope land and *desmontes*, where it is rotated with maize. In the lake area and the northern plateau towns, where the grain is likewise a rotation crop, it is cultivated on both plains and slopes. It is occasionally sown in the house-lot gardens in all parts of Tarasca.

Primitive European methods are used in wheat cultivation (pl. 6). Land is prepared by plowing with oxen, and seed is sown broadcast and covered with a brush harrow. Grain is cut with the sickle (*hoz*), bundled and tied by hand, and threshed in the *era* (an open arena floored with stone or packed earth) located in the town or in the field. Threshing is accomplished by driving mules or burros over the bundles of wheat, but where sufficient animals are lacking, it is done by flailing. The grain is separated from straw and chaff with the tarákua, or wooden spade. All straw is carefully saved for animal feed. (Engine-powered separators are just beginning to appear in the area.)

252 One of the most interesting aspects of wheat
262 culture among the Tarascans is the varieties of food prepared from both metate-ground and milled flour. Those made from grain wet-ground on the metate include *tortillas de trigo*, a common food in La Cañada, but eaten on fiesta days (e. g. Corpus) in the Sierra towns.[89] In Charapan the tortillas are thin, round cakes often 1 to 1½ feet in diameter, which are cooked on the comal. Thicker tortillas, or *gordas*, are similarly made, but browned on the coals.[90] For the Corpus fiestas *gordas* (pirícis) ¼ to 1 inch thick and shaped like

[87] For example, most temporal wheat in the Lake region is harvested in early April, while in the Sierra ripening is retarded until May. In Cumachuén, the highest pueblo in the Sierra, harvest occurs in the first weeks of June.

[88] The *trigales*, or wheatfields, are watered three times annually, at the end of January, first of March, and at the end of March. Pan irrigation technique is used.

[89] In the Lake towns of Ihuatzio and Janitzio metate-ground wheat dough is mixed with nixtamal (maize dough) to make a tortilla called ístakata.

[90] Beals (1946, p. 43) mentions that in Cherán *gordas de trigo* are fried in deep pork fat. This procedure was not encountered in other Tarascan towns.